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3/15/02

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March 15, 2002

BY MESSENGER

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U.S. Environmental Protection Agency
77 West Jackson Boulevard
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227576

Re: **GMO Site, 341 East Ohio Street, Chicago, Illinois**

Dear Mary:

Enclosed are three bound copies of the Amended Removal Action Work Plan dated March 13, 2002 prepared by STS Consultants, Ltd. ("STS") with respect to the GMO Site which consists of the following:

- Attachment 1 – Revised text of the Amended Removal Action Work Plan;
- Attachment 2 - Revised Organizational Chart (Figure 2-1);
- Attachment 3 – Revised Construction Schedule (Figure 3-2);
- Attachment 4 – Health and Safety Plan, Revision 2 dated February 14, 2002; and
- Attachment 5 – SOP-500, Immunoassay Pesticide Field Test Method.

In addition, we are enclosing three copies of the revised text of the Amended Removal Action Work Plan which has been blacklined to show all of the changes from the initial version of the Removal Action Work Plan dated May 1, 2001 which we submitted with our letter dated May 4, 2001. Please note that some of the changes marked on this blacklined copy are not new but were contained in the revised text which STS submitted with its letter dated July 26, 2001.

The enclosed bound copies include only the portions of the Removal Action Work Plan which have been changed from the forms previously submitted to the U.S.

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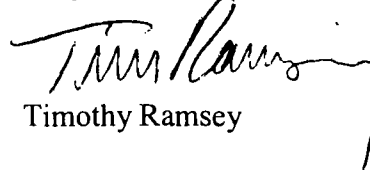
8. Pesticide Investigation Report dated February 25, 2002 prepared by STS which I submitted to you with my letter dated February 27, 2002.

Our client Teachers' Retirement System of the State of Illinois ("TRS") requests that USEPA approve the Amended Removal Action Work Plan and confirm its consistency with the Unilateral Administrative Order which USEPA has previously issued and pursuant to which this removal action is being performed.

Finally, please note that TRS will send you the response of the Illinois Environmental Protection Agency ("IEPA") to our two letters dated December 21, 2001 and January 29, 2002 relating to pesticides when we receive that response from IEPA.

Thank you for your cooperation and assistance in this matter.

Very truly yours,



Timothy Ramsey

JTR:tr

Enclosure

cc: Mr. Terry A. McKay (w/out enc.)
Mr. Thomas J. Pabian (w/enc.—by messenger)
Steven L. Loren, Esq. (w/out enc.)
Mr. Richard Berggreen (w/out enc.)

STS CONSULTANTS, LTD.



**Amended Removal Action Work Plan
341 East Ohio Street
Chicago, Illinois**

Teachers' Retirement System of the
State of Illinois

STS Project No. 1-25585-XG
~~May 1, 2001~~
March 13, 2002



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ATTACHMENTS

Attachment 1	Construction Quality Assurance Plan
Attachment 2	Quality Assurance Project Plan
Attachment 3	Health and Safety Plan, Revision 2

Attachment 4 Pesticide Investigation Report**APPENDICES**

Appendix 1	Transportation and Logistics Plan
Appendix 2	Permitting and Access Requirements Plan
Appendix 3	Traffic Control
Appendix 4	Emergency Contingency Plan
Appendix 5	Verification Sampling Plan
Appendix 6	Site Security Plan
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Appendix 8	Air Monitoring Plan
Appendix 9	Field Sampling Plan
Appendix 10	Dust Control Plan

Teachers' Retirement System - GMO Site
STS Project No. 1-25585-XG
March 13, 2002

**TEACHERS' RETIREMENT - GMO SITE
AMENDED REMOVAL ACTION WORK PLAN
MARCH 13, 2002**

1.0 SCOPE AND OBJECTIVES

The subject site for this Removal Action Work Plan (the "site" or the "subject site") at 341 East Ohio Street, Chicago, Illinois, is a vacant parcel of approximately 2.16 acres located at the northwest corner of McClurg Court and East Grand Avenue, Chicago, Illinois and is depicted on Figure 1-1. The site is currently a vacant, at-grade paved parking lot; however, the site is not presently being used for parking. Teachers' Retirement System of the State of Illinois ("TRS") previously made a mortgage loan secured by the site and after. After such mortgage went into default and, TRS subsequently acquired the site by deeds in lieu of foreclosure.

~~The site is across the street (north of East Grand Avenue) from the site at 316 East Illinois, Chicago, Illinois which is owned by River East, LLC, and on which radiologically impacted soils were previously detected by the U. S. Environmental Protection Agency ("USEPA"). USEPA determined that the radiologically impacted soil at the 316 East Illinois Street site was associated with the former operations of Lindsay Light Company at 316 East Illinois Street and 161 East Grand Avenue. On June 6, 1996, USEPA issued a unilateral administrative order ("UAO") pursuant to Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") to the Chicago Dock and Canal Trust (now known as River East LLC) and to Kerr-McGee Chemical Company (the corporate successor of Lindsay Light Company and now known as Kerr-McGee Chemical, LLC) requiring River East and Kerr-McGee to perform a removal action with respect to the radiologically impacted soil on the 316 East Illinois Street site (which USEPA designated "Lindsay Light II") and on any areas off the Lindsay Light II site on which such radiologically impacted soils were found. Subsequently, radiological impacts were discovered at the site which was owned by Grand Pier Center, LLC immediately to the west of (and across Columbus Drive from) Lindsay Light II and which was designated by USEPA as "Lindsay Light II/RV3 North Columbus Drive". USEPA determined that the radiological impacts at Lindsay Light II/RV3 North Columbus Drive were associated with the former operations of Lindsay Light Company. The site has historically been used for several different purposes, including buildings used to support supply and wholesale distributors; shipping and receiving operations; an experimental lab, a machine shop, printing and lithography operations and a waxed paper manufacturer. Velsicol Chemical Corporation (Velsicol) used all of the site buildings constructed by the previous occupants as~~



their corporate headquarters and as research and development laboratories for herbicides, insecticides and plant growth regulators from as early as 1917. Foundations and basements from these buildings are expected to be found on the property during the excavation and removal action process.

On March 29, 2000, USEPA amended the UAO to require Kerr-McGee, River East and Grand Pier to perform removal action at Lindsay Light II/RV3 North Columbus Drive.

TRS has previously entered into a contract to sell the subject site to a third party purchaser which engaged environmental consultants to perform environmental investigations of the site. B. Koh & Associates, Inc. ("Koh") performed a radiological investigation of the site including surface gamma radiation readings, down-hole radiation readings and soil sampling and analysis. Koh's report dated May 2000 documented its findings of elevated gamma radiation and radiological concentrations at the site.

TRS reported the findings in the Koh report to USEPA. On March 1, 2001, USEPA issued an Action Memorandum Amendment setting forth determinations by USEPA that, among other things, (1) the radiological impacts at the site are associated with the former operations of Lindsay Light Company and (2) the UAO requires Kerr-McGee to proceed with a removal action with respect to the radiological impacts at the site. TRS has made demand on Kerr-McGee to perform all removal actions required at the site, but Kerr-McGee has not agreed to perform all such removal actions. In order to provide for the performance of the removal actions, TRS and Kerr-McGee have agreed that (A) TRS will perform excavation, screening and sampling at the site as described in this Work Plan, (B) Kerr-McGee will transport and dispose of the radiologically impacted soils removed from the site, and (C) each of TRS and Kerr-McGee reserve their rights to, among other things, recover their costs with respect to their respective work activities which they will perform with respect to the site.

The site is across the street (north of East Grand Avenue) from the site at 316 East Illinois, Chicago, Illinois which is owned by River East, LLC, and on which radiologically impacted soils were previously detected by the U. S. Environmental Protection Agency ("USEPA"). USEPA determined that the radiologically impacted soil at the 316 East Illinois Street site was associated with the former operations of Lindsay Light Company at 316 East Illinois Street and 161 East Grand Avenue. On June 6, 1996, USEPA issued a unilateral administrative order ("UAO") pursuant to Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") to the Chicago Dock and Canal Trust (now known as River East LLC) and to Kerr-McGee Chemical Company (the corporate successor of Lindsay Light Company and now known as Kerr-McGee Chemical, LLC) requiring River East and Kerr-McGee to perform a removal

action with respect to the radiologically impacted soil on the 316 East Illinois Street site (which USEPA designated "Lindsay Light II") and on any areas off the Lindsay Light II site on which such radiologically impacted soils were found. Subsequently, radiological impacts were discovered at the site which was owned by Grand Pier Center, LLC immediately to the west of (and across Columbus Drive from) Lindsay Light II and which was designated by USEPA as "Lindsay Light II/RV3 North Columbus Drive". USEPA determined that the radiological impacts at Lindsay Light II/RV3 North Columbus Drive were associated with the former operations of Lindsay Light Company.

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~~(a) describes the survey methods which are proposed for identifying the radiologically impacted materials~~

TRS has also determined that a portion of the site in the vicinity of the building formerly located on the site at 330 East Grand Avenue has been impacted by pesticides. TRS has obtained a report from STS entitled Pesticide Investigation dated February 12, 2002 (the Pesticide Investigation Report) which sets forth the results of the investigation for pesticides in such portion of the site

(referred to as the "Pesticide Impact Area"). A copy of the Pesticide Investigation Report is attached to this Work Plan as Attachment 4.

~~(b) proposes excavation procedures for eliminating the impacted soils from the site~~

This Work Plan:

- ~~(c) details the screening methodology~~
(a) **describes the survey methods which are proposed for identifying the radiologically impacted materials**
- ~~(d) describes the air monitoring and health and safety plan~~
(b) **proposes excavation procedures for eliminating the radiologically-impacted soils from the site**
- (c) **proposes excavation and sampling procedures for removing certain pesticide-impacted soils from the Pesticide Impact Area.**
- (d) **details the radiological screening methodology**
- (e)- **describes the air monitoring and health and safety plan**
- (f) **outlines closure documentation and material disposal.**

It is the intent of this Work Plan that the work activities described will be consistent with the National Contingency Plan at 40 CFR Part 300 and that such work activities constitute a time critical removal action under 40 CFR Section 300.415. TRS requests that USEPA confirm that the work provided in this Work Plan constitutes a time-critical removal action consistent with the NCP.

It is the intention of this Work Plan, upon approval by USEPA, to perform the site survey, identify radiologically impacted soil and materials, ~~and remove all radiologically impacted soil and materials above the proposed cleanup threshold of 7.1 pCi/g total radium (Ra-226 + Ra-228)-), and remove all soils and fill material with pesticide concentrations in excess of the TACO Tier 1 residential standards for inhalation and ingestion as set forth in 35 Ill. Admin. Code Part 742, Appendix B, Table A from the Pesticide Impact Area.~~ Upon completion of all required excavation and removal of all identified radiologically impacted materials above the proposed cleanup threshold of 7.1 pCi/g total radium (Ra-226 + Ra-228)) and of all pesticide-impacted materials above the TACO Tier 1 residential standards for

inhalation and ingestion, TRS will request a closure document from USEPA to the effect that (i) all such work has been completed in accordance with this Work Plan, (ii) no further **radiological** investigation or removal action is required at this site, (iii) there is no evidence of any radiologically impacted material remaining at the site, and (iv) construction and development work on the site may proceed without further regulatory requirements relating to radiological impacts.

2.0 MANAGEMENT STRATEGY AND KEY PERSONNEL

This section of the work plan describes the management structure that TRS and its consultants will use to accomplish the excavation and removal activities.

2.1 Project Overview

There are three phases of work which comprise this Work Plan. These consist of the Investigation and Delineation Phase, the Initial Contaminant Removal Phase, and the Site-wide Excavation, Monitoring and Removal Phase. The Investigation and Delineation Phase was begun with the survey and sampling work previously completed by Koh and Associates, as reported in their May 2000 report. This phase will continue with the site surveys to be conducted as the asphalt pavement is removed. The Initial Contaminant Removal Phase will consist of the removal of the radiologically impacted zones identified in ~~phase-Phase 1-~~, **as well as the removal of pesticide-impacted soils in the pesticide impact area.** Finally, the Site-wide Excavation, Monitoring and Removal Phase will involve the surveying of all fill soils on site, and the segregation and removal for disposal of all radiologically impacted soils encountered. **in excess of the radiological cleanup standard of 7.1 pCi/g total radium.** A more complete description of these activities is presented in Section 3.0, Methodology.

2.2 Project Execution

Project execution consists of the three phases described above in Section 2.1, Project Overview. The following activities will be required by TRS to enable the project to begin.

- Finalize a contract with Kerr-McGee regarding its role to transport and dispose of the excavated materials, or obtain necessary authorizations to move excavated materials to ~~Envirocare~~**EnviroCare** of Utah, Inc. for permanent disposal.
- ~~Send bid documents to~~**Enter into a contract with a** qualified contractors ~~and contract~~**contractor** for the excavation services. Arrange appropriate logistical support services such as fencing and site security, office and equipment trailers.
- Notify and obtain appropriate permits for the implementation. This includes City of Chicago, USEPA and State of Utah authorities.

The following activities must be accomplished to complete the project:

- All identified radiologically impacted material above the proposed cleanup threshold of 7.1 pCi/g total radium (Ra-226 + Ra-228) has been removed from the site.
- **All identified pesticide-impacted soils above the cleanup threshold of Illinois EPA Site Remediation Program TACO Tier 1 residential standards for ingestion and inhalation have been removed from the Pesticide Impact Area.**
- TRS has received USEPA verification sign-off that all radiologically impacted materials above such cleanup threshold have been removed from the site.
- Equipment and personnel have been demobilized from the site.
- TRS has submitted the required documentation to USEPA for closure of the site.
- USEPA has responded acknowledging the sufficiency of the removal and documentation, in accordance with the UAO and Amendments.

2.3 Project Management Structure

The management structure under which the project will be accomplished is illustrated in Figure 2-1 of this Work Plan. The Project Team consists of USEPA and its support organizations, TRS and its consultants, the construction teams comprised of TRS' consultants, contractors and subcontractors, and Kerr-McGee and its contractors involved in the transportation and disposal tasks. **The TRS Project Team consists of the following members:**

- TRS Project Manager, Mr. Tom Pabian
- STS Project Coordinator, Mr. Richard Berggreen
- Quality Assurance Manager, Mr. Ron Palmieri
- STS Project Manager, Mr. John Esser
- STS Field Team Leader, Mr. Dumas Guerrier
- Health and Safety Officer, Mr. Keith Carlson
- Kerr-McGee, Mr. Mark Krippel
- Health Physicist Supervisor, Mr. Glen Huber

The duties and responsibilities of these positions and organizations are summarized below.

USEPA will be represented by its On-Scene Coordinators (OSCs), whom we understand will be Mr. Fred Micke and Ms. Verneta Simon. Mr. Larry Jensen, Radiation Health Physicist and other support staff will assist the OSCs. Argonne National Laboratory will provide laboratory subcontract services for radiological analysis of samples from this project.

TRS will be represented by its project manager who will be responsible for communications between TRS and the project team. The TRS project manager will review project documents, plans, and progress reports to confirm the plans and implementation are consistent with TRS objectives.

The Project Team Project Coordinator will have overall responsibility for coordination of project communications and resources. These responsibilities include communications between the project team and USEPA, and among the various members of the project team, including Kerr-McGee, the Health Physics subcontractor, the excavation contractors, and other subcontractors on the project. The position description is included in the QAPP.

The **STS** Project Manager will be responsible for day-to-day implementation of this Work Plan. This will include coordination of schedules with the contractors and subcontractors, planning and scheduling activities with the USEPA to provide for verification of remediated locations, and documentation of activities as provided for in this Work Plan.

The Field Team Leader is responsible for coordinating the field activities, in particular coordinating the excavation and health physics technician subcontractors. The Field Team Leader will be responsible for day-to-day communications with the USEPA's ~~OSC~~ OSCs whenever the OSCs are on site.

The Project Quality Assurance Manager will provide guidance on quality assurance/quality control (QA/QC) issues. This includes but is not limited to guidance regarding sampling, data validation and chain of custody procedures. The Quality Assurance Manager will provide the Project Coordinator copies of reports pertaining to QA/QC.

The Quality Assurance Manager functions independently from the personnel directly responsible for accomplishing the excavation and removal. He/she reports to the Project Coordinator and the TRS Project Manager and has access to higher levels of management with whom he/she can consult to resolve quality related project issues.

Kerr-McGee will be responsible for transportation and disposal of the radiologically impacted materials excavated and removed from the site. That responsibility includes health physics personnel to survey the transport containers, subcontractor transportation and logistics personnel, and documentation for shipping and disposal. The disposal is proposed to be under an existing contract with ~~Envirocare~~**EnviroCare** of Utah, Inc. In the event Kerr-McGee is unable to fulfill this role, a logistics subcontractor will be available to complete this work. The anticipated scope of this work is presented in Appendix 1 of this Work Plan.

2.4 Delineation and Design

Delineation of the radiologically impacted materials was initiated through an investigation completed by B. Koh and Associates, Inc. as documented in its report dated May 2000, "Summary of Radiological Survey, Time-Life Property, Chicago, Illinois". The delineation will be further developed in the initial stages of removal as the pavement is removed from the site and the ground is surveyed. This is described below in Section 3.1.3, Site Survey and Section 3.1.5, Excavation Work.

The removal work scope will require sloping of the excavation side slopes up to the property line. The wedge of material remaining unexcavated on-site will be sloped as steeply as can be safely accomplished without endangering the adjacent right-of-way, likely on the order of 1 V:1.5 ~~÷ 1 or 1 ÷ 1~~. ~~This wedge of material will be surveyed for elevated gamma radiation on the surface and through slots excavated into the slope at intervals of approximately 3 meters (10 feet). Any identified radiologically impacted material will be removed to the property line. This design detail will be provided with this Work Plan as part of any bid package to contractors who might be invited to bid on the proposed excavation and removal work.~~ **H. Prior to excavation, this wedge of material was surveyed for elevated gamma radiation utilizing a series of borings on a 2-meter square grid as described in the letter report dated February 6, 2002 prepared by STS entitled "Perimeter Drilling Results", 341 East Ohio Street, Chicago, Illinois – STS Project No. 1-25585-XG, Correspondence No. 041" (the "Perimeter Drilling Report") which was submitted to USEPA on February 8, 2002. Any radiologically impacted material in excess of the radiological cleanup standard of 7.1 pCi/g total radium as identified in the Perimeter Drilling Report will be removed to the property line during the excavation phase of the project. In addition, following completion of the excavation, the surface of the sloping wedge of material remaining in place will also be surveyed.**

The **slope** design will be submitted for review and will conform to the requirements of the appropriate public agency or governmental oversight unit.

The delineation of the pesticide-impacted soils to be removed was initiated in the GaiaTech Phase II Soil and Groundwater Investigation, May 11, 2000 ("GaiaTech"). The delineation was further developed through the Pesticide Investigation Report attached as Attachment 4 to this Work Plan. The delineation will be further refined in the initial stages of the excavation following the removal of the known radiologically-impacted soils in the Pesticide Impact Area.

2.5 Construction

Excavation and removal activities will be completed in accordance with the terms of the UAO, the specifications of the Construction Quality Assurance Plan (CQA Plan) and this Work Plan. The CQA Plan is Attachment 1 to this Work Plan.

Excavation will be scheduled so that activities will proceed expeditiously. Activities will normally be scheduled during daylight hours, Monday through Friday. Exceptions to this may be made where, for example, the Field Team Leader determines that extended work hours will allow a work item to be completed or secured before a weekend or before inclement weather. It is proposed to the extent possible to transport containers at night to avoid traffic congestion. The USEPA will be advised as soon as practical before working during extended hours.

2.6 Maintenance

Following completion of the removal, it is proposed to continue the site security, i.e., fencing the entire perimeter and maintain the site as at the completion of the removal and replacement of the clean excavated spoil. Environmental Remediation Caution signs will be removed from the site perimeter upon receipt of notice from USEPA that all radiologically impacted material has been removed from the site. Any additional work beyond the completion of the removal and replacement of the clean spoil will be in accordance with the construction permit specifications from the City of Chicago.

2.7 Monitoring

Air monitoring will be conducted at two levels. Site perimeter monitoring will be conducted at the four sides of the site (north, south, east, and west). This air monitoring is for the purpose of documenting, and if detected, initiating measures to control off-site airborne contamination. Air monitoring will be conducted in accordance with the Air Monitoring Procedure, SOP 212.

Personal air monitoring will be required for workers in an exclusion zone. Procedures for personal air monitoring are presented in the Health and Safety Plan included in Attachment 3.

2.8 Reporting

Monthly progress reports will be submitted to USEPA beginning 30 days after USEPA's approval of this Work Plan, and will be submitted monthly by the 15th of each month until termination of the UAO **as applicable to this site**, unless otherwise directed by the OSC. These monthly reports will describe all significant developments during the preceding period, including the work performed, and any problems encountered, analytical data received during the reporting period, and developments anticipated during the next reporting period, including a schedule of work to be performed, anticipated problems, and planned resolutions.

A closure report will be prepared upon completion of the removal of all identified impacted material from the site, and acknowledgement from USEPA that the removal work is complete and the closure report is due. The closure documentation report will provide a summary of the locations remediated, the volumes of all materials removed and their disposal locations, resources allocated and costs for the removal, analytical results, field data documenting the clean closure, and a certification in accordance with the requirements of the UAO. This closure documentation report will be provided within 60 days of the completion of the removal of all identified radiologically-impacted soil.

2.9 Existing Data

The following reports of previous environmental investigations were provided by TRS for the preparation of this Work Plan.

- Letter dated August 22, 1990 from OHM Corporation to GMO Limited Partnership
- Environmental Site Assessment dated August 28, 1990 prepared by Professional Service Industries, Inc.
- Visual Site Inspection dated December 30, 1993 prepared by USEPA, Region V, with attached Preliminary Assessment/Visual Site Inspection Report dated December 16, 1993 prepared by PRC Environmental Management, Inc.
- Preliminary Environmental Review dated March 8, 2000, prepared by GaiaTech, Inc.

- A Phase II Soil and Groundwater Investigation Report Time-Life Property, Grand Avenue and McClurg Court, Chicago, Illinois, dated May 11, 2000, prepared by GaiaTech, Inc.
- Summary of Radiological Survey Time-Life Property, Chicago, Illinois, dated May 2000, prepared by B. Koh & Associates, Inc.
- Scanner Van Survey of the Chicago, Illinois Streeterville Area dated July 12, 2000 prepared by USEPA Radiation and Indoor Environments National Laboratory.

3.0 METHODOLOGY

3.1 Description of Work Activities

3.1.1 Site Preparation

The site is currently a vacant, out of service, paved parking lot. There are no structures on the property. A traffic guardrail surrounds most of the site and will require removal. The existing light poles on the site will also require removal. Storm drains are present on-site and will require removal as work proceeds. They will likely be removed as part of excavation rather than in the utility abandonment task. **Structures/foundations from Velsicol should be expected.** Prior to beginning the removal of the pavement, no other demolition activities are anticipated as part of site preparation.

A 5 meter by 5 meter site grid will be established for the site. Grid lines will be alphabetic from north to south, and numeric from west to east. Site locations will be referenced to this alpha-numeric grid during the remediation and closure documentation.

Other site preparation efforts such as fencing, utility closure, logistical support facilities, and pavement removal in preparation for surveys and removal efforts are discussed below.

3.1.2 Permits

All necessary permits and sign-offs will be secured for the implementation of the site excavation, survey, and remediation work. Permit applications will reflect the exemption available for work on CERCLA-directed project sites. Permits and sign-offs for work at this site may include but are not limited to the following:

- excavation permit;
- Board of Underground review;
- street closure/sidewalk closure permit;
- ~~wrecking permit;~~
- consultation with the Sewer Department;
- meetings with utilities; and
- consultation with the City of Chicago Department of Environment.

Details of the permit process, the necessary permits, permitting agencies, and utility protection are provided in the Permitting and Access Requirements Plan, Appendix 2.

3.1.3 Site Survey

Prior to any work at the site including demolition or removal of any pavement or features at the site, the following will be documented by the Field Team Leader, his designee, or a licensed surveyor.

- The site grid at 5 meter spacing will be established.
- The site boundaries will be located and marked.
- The location of all surface features such as the guard rail, storm drain catch basins, utility vaults, light standards, etc.
- A photographic record of the site will be made and retained in the project files.

The beginning of the removal work task will be to begin removal of the asphalt pavement cover in stages. Once the asphalt paving is removed from each area of the site, as shown in Figure 3-1, 100% of the soil surface in each such area will be surveyed for elevated gamma readings. This survey work will be part of the Investigation and Delineation Phase that was begun with the Koh investigation as documented in its report dated May 2000. The survey will cover the exposed soil on survey lines spaced 5 meters. Gamma count values shall be taken at intervals spaced 5 meters (5 x 5 meter grid). The site grid will be marked by stakes and flagging at the edges of the property and by paint on the ground surface on the interior of the site. The areas between the grid points will be scanned following Documents SOP 210 so as to cover the intra-grid areas.

3.1.4 Utilities

For this project, "utilities" include natural gas, water, sewer, communication, cable television lines, and electrical power distribution systems. Prior to the physical site survey, city and utility company records concerning location and construction of utilities on and in the general vicinity will be reviewed and consolidated on a single Utility Plan Drawing. This drawing will be based on City of Chicago maps. The appropriate utility companies or their designees will be asked to verify the location by originating a request through the Chicago Utility Alert Network (DIGGER) phone number: 312-744-7000, and through application to the Chicago Board of Underground.

During the physical site survey, the locations of the identified utilities will be "ground-truthed" by observing the locations of power and phone poles, above-ground transformers (where electrical distribution lines are below ground), manholes, water meters, natural gas meters, phone boxes, surface indications such as utility vaults, catch basins, and surface depressions which can occur over utility trenches, and the locations marked by the utility companies or their representatives.

The locations of these utility indicators will be plotted on the Utility Plan Drawing, and compared with indicated locations. Discrepancies of more than 1 meter (about 3 feet) will be noted. Procedures for working in the vicinity of utilities and repair to damaged utilities will be discussed with the excavation contractor crews. All work on and in the vicinity of utilities will be in accordance with City and utility company specifications.

3.1.5 Excavation Work

Excavation will proceed in two phases, the initial contaminant removal phase and the site-wide excavation, monitoring, and removal phase, with the first phase being completed before beginning the second phase. The initial removal will be of the radiologically-impacted soils identified through the site walk-over gamma survey following removal of the asphalt cover. Those soils will be removed to apparently clean limits, at or below 7.1 pCi/g total radium. Excavation will utilize an excavator with a maximum 1 cubic yard (C.Y.) bucket. This bucket size will facilitate loading the transport containers without spilling and spreading the contamination. The excavations will be designated exclusion zones for purposes of health and safety requirements.

The removal of pesticide-contaminated soils from the Pesticide Impact Area will be coordinated with the removal of the radiologically-impacted soil. The radiologically-impacted soil in the Pesticide Impact Area will be removed to clean limits below 7.1 pCi/g. Some of the radiologically-impacted soils in the Pesticide Impact Area are known to have pesticide concentrations, and any such radiologically-impacted soils (including those containing pesticides) will be excavated and placed in boxes for transport and delivery to EnviroCare in Utah. The limits of the pesticide-impacted soils in the Pesticide Impact Area will be laid out on the basis of the previously completed borings. The pesticide-impacted soils in the Pesticide Impact Area will be marginally over-excavated in order to leave soils that are clean to the pesticide limits listed in TACO Tier 1 residential standards for ingestion or inhalation (whichever is lower) in 35 Ill. Admin. Code Part 742, Appendix B, Table A for the following pesticides identified on-site: chlordane, aldrin, alpha-BHC, lindane, dieldrin, heptachlor, and heptachlor epoxide.

As the pesticide excavations are made, the soil will be screened for radioactivity in 18-inch lifts. Upon completion of the removal of all apparent pesticide-impacted soils in the Pesticide Impact Area, the limits of the excavations will be sampled and tested using the immunoassay field tests (Envirogard Soil Test Kit and Sample Extraction Kit protocols are included in the QAPP as SOP 500). The sampling frequency will take place every 100 square meters. The immunoassay tests will be run using a 3x dilution to match the TACO Tier 1 residential standard for inhalation and ingestion. Cleanup to this standard will allow for unrestricted development of the site.

Additionally, soil will be removed as needed from the Pesticide Impact Area to achieve compliance with the stipulated pesticide cleanup objectives. All pesticide-impacted soils which are not radiologically-impacted over the radiological cleanup standard will be disposed of at a landfill permitted to accept such soils. Pesticide-impacted soils will not be stockpiled on site but will be loaded into trucks for transport and off-site disposal on the day of excavation. Any soils temporarily stockpiled during the day prior to transport will be stockpiled in the interior of the site, avoiding the site margins.

Laboratory analysis will be provided to confirm the total concentrations of pesticides to document compliance with the pesticide cleanup levels once the apparent clean closure of the pesticide removal is demonstrated by field testing. Following receipt of the laboratory results indicating removal of all pesticide-impacted soil in the Pesticide Impact Area in excess of the stipulated cleanup objectives, the pesticide cleanup work in the Pesticide Impact Area will be considered completed and the excavation and screening for radiologically-impacted soil will continue.

The second phase of excavation will be to excavate and radiologically screen all of the fill soil within the site perimeter (except in the perimeter areas which have previously been radiologically cleared through soil borings as described in the Perimeter Drilling Report), and any of the underlying native soils which exhibit levels of radioactivity requiring removal and off-site management. This second phase will involve staging of non-radiologically impacted soil for use as backfill as the excavation progresses. Radiologically-impacted soil will be loaded into Supersacks and temporarily stored on-site until sufficient material is accumulated to warrant bringing a transport container to the site. Arrangements for the use of "Baker Boxes" will be made before construction starts; site mobilization will include provisions for the staging of these boxes as soon as they are needed. Staged material in Supersacks will be maintained in a secure location, on pavement or a membrane and covered to protect from wind and precipitation.

At present it is anticipated that the excavation will progress from the west end toward the east. This progression is anticipated based on the fact that it appears from current information that there is a larger area of impacted soil at the west end of the site. Therefore, this area may already have significant areas excavated and disrupted as a result of the first phase excavation. Excavating and screening the remaining portion of the west end of the site will allow this area to be released, regraded, and used as the temporary staging areas for non-radiologically impacted overburden and fill from the remainder of the project. Phase 2 material which is below the 7.1 pCi/g cleanup criteria and is used as backfill on-site will be spread, compacted and graded to provide a stable driving surface for staging soil and loading containers. Fill material will not be imported to bring the site back to its original grade.

Excavation will be limited to not more than 18 inches per lift followed by a survey for elevated gamma readings. This restriction is due to the shielding provided by soil which could preclude detecting impacted soil beneath a soil cover of 18 inches or more.

Excavation will proceed through all fill soils within the subject site- **except in the perimeter areas which have previously been radiologically cleared through soil borings as described in the Perimeter Drilling Report.** The fill soils are underlain by natural soils consisting of medium to coarse sand and fine gravel. This natural soil will be screened to confirm no radiological impacts and will be subject to verification surveys and sampling by USEPA, in accordance with Section 3.1.7 of this Work Plan. Where floor slabs are present at the base of the fill, the slab will be broken and removed and the soil beneath the slab screened for verification and closure by USEPA. Concrete slabs, footings or walls encountered during the excavation will be cleaned of adhering contamination and after release as non-contaminated, will either be removed from the site or stockpiled on-site for subsequent management in connection with site development work. It is not proposed to bury these oversize pieces in the backfill.

In the deepest parts of the excavation, depths of 15 feet or more may be reached. These depths may encounter groundwater at a depth of 13 to 14 feet, based on previous borings. The potential for having to manage groundwater will be addressed through permitting from the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). Notice to and discharge permits from the MWRDGC and Chicago Department of Sewers will be provided prior to discharge of any water off site. It may be possible to manage the water on-site without the need to discharge to the city sewer system. Available information indicates that only a small part of the site, near the northeast corner, will have an excavation as deep as 15 to 16 feet. It may be possible to lower the water through excavated sumps, and pump the water to the west end of the site and use it as dust control, or simply let it infiltrate through the site fill soil.

3.1.6 Materials Management

Actions to manage removed material include all actions taken from the time the material is excavated until it reaches its final destination. Materials that are removed from the property may be replaced in their original locations, placed in another location on the property, salvaged, or sent to a local landfill if the materials meet the **radiological** clean-up criteria of **7.1 pCi/g total radium**. Materials that do not meet the cleanup criteria will be sent to an approved disposal facility. At present, it is anticipated the radiologically-impacted material will be sent to ~~EnviroCare~~ **EnviroCare** of Utah, located in Clive, Utah. **It is anticipated that all pesticide-impacted non-radiological materials will be disposed of at Waste Management CID landfill in Calumet City, Illinois.**

Any trash and debris -which TRS elects to remove from the site and which are not radiologically-impacted **or pesticide-impacted** will typically be placed into clean roll-off containers provided and collected by licensed trash removal and disposal companies. Radiologically-**impacted and pesticide-impacted** materials will be transported between the Site and the approved disposal facility according to DOT regulations. Procedures which will be used with respect to radiologically-impacted **and pesticide-impacted** materials to minimize the potential for and effects of spills and accidents during transport of such radiologically-impacted materials include but are not limited to the following:

- Drivers will have the proper licenses, training, and certifications for transporting potentially radioactive materials.
- Trucks transporting low-level radioactive materials **in excess of 7.1 pCi/g total radium** will have sealed or lined containment. Covers for the roll-off containers will be placed over the load prior to exiting the contaminated area. Covers will be fastened down tightly to prevent materials from being blown out of the containers. This will minimize the escape of materials should an accident occur. Empty containers returning to the site will also have covers. Trucks will carry all necessary papers and placarding. Containers will be inspected prior to loading to determine suitability.
- **Trucks transporting pesticide-impacted soil will have covers. Covers for the trucks will be placed over the load prior to exiting the site. Covers will be fastened down tightly to prevent materials from being blown out of the trucks. Trucks will carry all necessary papers and placarding.**

- Contaminated vehicles and equipment will be decontaminated first using broom cleaning to remove all adhering surface dirt. As needed, pressurized water spray will be used for further decontamination. Water generated during decontamination will be contained and evaporated or used for dust control, or possibly for disposal at an approved disposal facility.
- Prior to transporting excavated soils or other materials, all transport equipment will be frisked. Frisking will include tires and fenders and the sides and back of the bed. Frisking the cabs of trucks will not be necessary unless loading has been over the front of the truck.
- Travel between the property and the rail terminal will be only on specified routes selected to minimize the potential for and the effects of any accidents. Criteria used to select routes and Traffic Control procedures are described in Section 3.2 and Appendix 3 of this Work Plan.
- An Emergency Contingency Plan (Appendix 4) has been prepared for this project. This plan includes procedures to be implemented in the case of an accident. All truck drivers will be trained in and familiar with these procedures.

~~Two~~Three types of material will be distinguished in the excavated material:

- Radiologically-impacted soil exceeding the clean-up threshold of 7.1 pCi/g total radium, and
- ~~Non-radiologically~~ **radiological pesticide-impacted soil exceeding the pesticide clean-up threshold of the TACO Tier 1 residential standards for ingestion or inhalation**
- **Excavated soil suitable for backfill- which is neither radiologically impacted in excess of 7.1 pCi/g total radium nor impacted by pesticides in excess of the TACO Tier 1 residential levels for inhalation and ingestion as specified in 35 Ill. Admin. Code Part 742, Appendix B, Table A.**

There may be materials that will be specified by the owner as unsuitable for backfill, based on engineering properties, non-radiologic impacts, or other specifications. For this Work Plan, ~~only the radiological~~ a distinction is proposed: **for radiologically-impacted materials and pesticide-impacted materials**. Any disposal of non-radiologically impacted materials at any off-site location will comply with all applicable laws and regulations.

Soils which, based on visual or olfactory observations, are suspected to be grossly impacted by non-radiological contamination, will be **temporarily staged at an interior location** on-site to allow for sampling and ~~waste~~-characterization to provide for disposal permitting. These soils will be placed on liners and will be covered to minimize potential for erosion and spread of the material. To the extent possible the materials will be staged on pavement to minimize potential to impact underlying soils. The proposed staging area is shown on Figure 3-1.

Radiologically-impacted soil **and pesticide-impacted soil** excavated in Phase 1 will be loaded directly into containers. In Phase 2, it is anticipated the excavated quantities of material exceeding the **radiological** cleanup standard at individual locations will not fill a container. Where that is found to be the case, soil exceeding the **radiological** cleanup level will be temporarily stored in Supersacks until enough has accumulated to warrant delivery of a container. Where locations are encountered during Phase 2 where significant quantities of **radiological** material require removal, direct loading of containers will be resumed.

3.1.7 Verification Sampling

Soil exhibiting contamination above the clean-up threshold of 7.1 pCi/g total radium (Ra-226 + Ra-228) will be removed, placed in transport boxes as specified in the S&P documents, and shipped to Envirocare of Utah.

In order to demonstrate that the floors and sides of soil excavations meet cleanup criteria described in the UAO, a verification/field sampling program must be implemented following the excavation of the radiologically-impacted materials. The verification survey and sampling program will be conducted in general accordance with SOP-223.

Initial field demonstration that the location has been excavated to clean limits will be made with a 2 x 2 NaI detector which has been calibrated against the calibration blocks at the Kerr-McGee West Chicago facility. Pre-verification samples will then be collected and analyzed at an on-site laboratory using NUTRANL software and gamma spec analyses. Excavated locations will be screened in accordance with SOP-210.

Upon completion of the removal of all apparent pesticide-impacted soils from the Pesticide Impact Area, the limits of the excavations will be sampled and tested using the immunoassay field test methodology described in SOP 500. Samples will be taken every 100 square meters. The immunoassay tests will be run using a 3x dilution to match the TACO Tier 1 residential standard

for inhalation or ingestion, whichever is lower. Laboratory analysis will be provided to confirm the total concentrations of pesticides to document the cleanup levels once the apparent clean closure of the pesticide removal is demonstrated by field testing.

Detailed descriptions of the **radiological** verification sampling, analyses, and comparisons which will be done for this sampling are provided in Appendix 5 of this Work Plan. The excavations will not be backfilled until a signed **radiological** verification closure form is received from USEPA.

3.1.8 Description of Crews and Production Schedules

Construction activities have been identified in the previous sections of this Work Plan. These activities include surveying, radiologically surveying **and removal, pesticide removal**, general excavation, and transportation. Personnel required to complete each of these activities have been grouped into crews, and the crews are described below. Subcontractors may be used for some work, such as fencing, concrete and paving work.

Personnel in addition to those described above will be necessary for this work. These personnel include health and safety personnel, quality inspectors, supervisors, and other management personnel. These personnel are described in the QAPP.

3.1.9 Survey Crew

A physical survey of the site ~~will be~~ **has been previously been developed by a licensed land surveyor**, including utilities, structures, property limits on both the site and the adjacent rights-of-way. ~~It is anticipated that the survey will be prepared by a licensed land surveyor.~~ Additionally, the Field Team Leader will locate and mark with signs, flagging, stakes, etc. the site 5 meter grids along the margins of the site.

3.1.10 Radiological and Pesticide Survey Crews

The radiological survey crew will be responsible for the initial site survey, surveys as the soil is excavated, surveys prior to the USEPA verification surveys and the surveys of equipment prior to leaving the site. ~~Radiological~~ **The pesticide survey crew will delineate the Pesticide Impact Area, based on previous borings and monitor the removal to these limits. This crew will conduct the immunoassay field tests to assess whether the excavation has reached clean limits. This crew will take the verification samples for laboratory confirmation. These radiological and pesticide survey crews will**

typically be comprised of two persons, and are required to have a minimum of two persons when working in exclusion zones, in accordance with the Health and Safety Plan.

3.1.11 General Excavation Crew

The general excavation crew will consist of the ~~subcontracter~~**contractor's** excavation personnel, and is anticipated to include as a minimum, the excavator operator, a laborer, and a truck driver. As excavation proceeds, additional operators, laborers and drivers may be added. As grading of non-radiologically impacted soil proceeds following the removal of the impacted soil, additional personnel will be present on site for that grading work. The size of the crew will depend on the size of the work area and the complexity of the work.

3.1.12 Production and Schedules

Work is proposed to be conducted during the ~~2001~~**2002** construction season, and be completed before ~~December 2001~~**August 2002**. An anticipated construction schedule is included as Figure 3-2.

The following presents the anticipated schedule and sequencing of the excavation and removal project. Note that certain tasks are required prior to the start of the removal effort, but are not detailed in this schedule and sequencing section. These include but may not be limited to the driveway permitting required prior to proceeding, and the logistical support such as site security, mobilization of office trailers, transportation containers, excavating equipment, and training of the contractor and subcontractor personnel.

- The perimeter and site interior guardrail will be removed. ~~This may be done at the same time as the fence is installed and site grid is established and marked.~~ Guard rail posts and footings from below ground will be surveyed for radiological impacts. **The perimeter fence has been installed and site grid has been established and marked.**
- The utilities will be located and as necessary, cut-off and abandoned.
- The existing light poles on the site will be disconnected and removed.
- The asphalt stripping will begin. It is proposed to strip initially only the southwest portion of the site, retaining pavement along the north and east sides of the site. ~~After the removal of radiologically contaminated-impacted materials from the southwest portion of the site and removal of pesticide-~~

impacted soils from the Pesticide Impact Area, and the completion of screening of surrounding soils in that portion ~~these portions~~ of the site, the remaining portions of the site will be addressed for radiological materials according to the same procedures for removal and screening of radiological materials and in accordance with the sequence depicted on Figure 3-1.

- The asphalt and sub-base will be screened for radiological impacts as they are removed. The underlying soil will be surveyed as the asphalt and sub-base are removed.
- Removal of the identified radiologically-impacted soil will be performed first. In the southwest portion of the site, removal of the non-radiological pesticide-impacted soil will be performed second. The removal will proceed until all initially identified ~~soil has~~ radiologically-impacted and pesticide-impacted soils have been removed.
- Preparation of the closure documentation report will begin upon removal of all identified radiologically impacted soil. This report will be submitted within 60 days of USEPA notice that all identified ~~radiologically impacted soil has~~ materials required to be removed pursuant to this Work Plan have been removed from the site.

3.2 Traffic Control

During the removal project, trucks carrying excavated impacted material will be traveling between the site and the rail terminal. ~~Truck traffic or~~ **Waste Management. Traffic from trucks carrying the radiologically-impacted soil** will not be extensive, perhaps 5 to 10 with a maximum of 15 trucks a day, and may be conducted during nighttime hours when local traffic congestion is minimized. **Trucks traffic carrying pesticide-impacted soil will be more extensive during the removal phase of these soils, perhaps 20 to 40 trucks a day. Trucks carrying pesticide-impacted soils will travel during the day from the site to the disposal site.** Traffic controls will be implemented to minimize the potential for accidents to occur. A summary of the criteria which will be used to select the traffic routes is provided below.

- Routes will be adequate to support the loads. The selected route must be capable of supporting the loaded trucks. Routes with small light bridges and surfaces other than asphalt or concrete in good repair will be avoided wherever possible.

- Ease of travel. The route should minimize the number of stops and turns, and the streets should be sufficiently wide for two trucks to pass where other vehicles are parked on both sides of the street.
- Minimum other traffic. Major traffic routes should be avoided. The more traffic, the greater the potential for an accident to occur. Also, minor traffic routes generally have lower speed limits than major routes. Hours of hauling impacted materials to the rail terminal will be selected to avoid rush-hour traffic.
- Approval of the route. TRS or Kerr-McGee will prepare and submit proposed route maps to the City of Chicago Department of Transportation for approval **of both the radiologically-impacted soil and the pesticide-impacted soil.**

A detailed description of the Traffic Control Plan is provided in Appendix 2 of this Work Plan.

3.3 Site Security Plan

A detailed description of the Site Security Plan is provided in Appendix 6 of this Work Plan. This section provides a summary of the measures which will be taken to minimize the potential for accidents during the work. The work may create several potentially hazardous conditions. These conditions include but are not limited to the following:

- Open excavations
- Moving construction and excavation equipment
- Truck traffic

Only authorized persons will be permitted on-site. Authorized persons include the Project Manager, consultant personnel, contractors, subcontractors, and their representatives. USEPA personnel are authorized to be on-site subject to compliance with OSHA requirements and other reasonable safety precautions.

Visitors and other non-essential personnel may enter the work area only upon notice and authorization by the **STS** Project Manager or designee. This restricted access will ensure the **STS** Project Manager or designee can communicate to visitors appropriate safety information.

The site will be secured with a construction security fence around its entire perimeter. Gates will be provided at access points but will remain closed and locked when not in use and when there are no removal activities on-site.

Signs will be posted at a maximum of 100 foot intervals around the perimeter fence and at each access gate. The signs will read:

"UNDERGOING ENVIRONMENTAL REMOVAL ACTION

FOR FURTHER INFORMATION CONTACT

~~(CONTACT NAME AND PHONE NUMBER)~~
THOMAS PABIAN AT 312-573-5300

Your call will be returned during normal business hours.

Please leave your name and telephone number after the recorded message."

3.4 Health and Safety Plan

This section briefly describes the key personnel responsible for health and safety on the project, the types of hazards which might be encountered during the work to be done, the proposed training, and the personnel protective equipment (PPE) which may be worn for the potentially hazardous conditions which might be encountered.

3.4.1 Key Personnel

While health and safety will be the concern of every person on the job, two persons will have health and safety as their primary concern. These persons are the Health and Safety Officer and the Field Team Leader. The responsibilities for these positions are detailed in the Health and Safety Plan, Attachment 3 to this Work Plan.

3.4.2 Potential Hazards

Potential hazards which could be encountered during the removal activities include contaminated materials and the hazards associated with construction work. Contaminants of concern include the entire decay series for U-238 and Th-232, as well as exposure to pesticides, including chlordane, aldrin,

lindane, dieldrin, heptachlor, and heptachlor epoxide. Clean-up criteria for radiologically-impacted soil are based on total radium, Ra-226 plus Ra-228.- Clean-up criteria for pesticide-impacted soil are based on the TACO Tier 1 residential standards for ingestion or inhalation, whichever is lower, in 35 Ill. Admin. Code Part 742, Appendix B, Table A. Radiologic and air monitoring as described in this Work Plan will be performed during excavation to further define the presence of these radiological contaminants.

The mechanisms for exposure to these materials are direct exposure, inhalation, ingestion and eye/skin contact. The primary mechanism of exposure is direct exposure to external gamma radiation. All workers will be instructed in appropriate measures to protect against exposure to the above materials, and PPE will be worn until monitoring shows such is not necessary.

Physical hazards which might be encountered at this site include but are not limited to the following:

- Construction equipment (front-end loaders, back-hoes, trucks, compactors, bulldozers);
- Power tools (saws, drills, jack hammers, compactors);
- Heat and cold stress;
- Overhead power lines;
- Buried utilities;
- Excavations;
- Confined space;
- Noise;
- Demolition of structures; and
- Slip, trip and fall conditions, especially during wet or freezing periods.

3.4.3 Training

Site and project specific radiation and health and safety training will be provided for all on-site personnel prior to work on site. All personnel required to work in the Contamination Reduction Zone or the Exclusion Zone shall complete training conforming to the requirements of 29 CFR 1910.120(e) including 40 hours of initial hazardous waste site worker training. Where appropriate, they shall have 8 hours of annual refresher training, and 8 hours supervisors training. Field personnel shall complete radiation safety training in compliance with 32 IAC 400. This training shall include, at a minimum, 4 hours of training pertaining to radiation safety and awareness. Training will be conducted by a qualified safety specialist and/or a qualified senior health physics technician, at a minimum. The Project Training Program is included in Appendix 7. As noted in the Health and Safety Plan, Federal safety requirements take precedence over state requirements.

All site personnel will be trained and briefed on radiation basics, anticipated hazards, equipment to be worn, safety practices to be followed, contamination prevention practices, emergency procedures, radiation basics and communications. Procedures for leaving a contaminated area shall be planned and implemented prior to going on-site. Work areas and decontamination procedures will be established based on expected site conditions, and updated as necessary during construction.

In addition to this formal health and safety training, "tailgate" safety meetings will be held ~~every week~~ weekly, or more frequently, dependent on safety issues arising during the project. These meetings may be led by the worker's foremen and every employee must sign in before beginning work for the week. The subject covered and persons present will be recorded for each meeting and kept as part of the project records. Health and safety incidents and monitoring results will be discussed in the tailgate safety meetings, when appropriate.

Visitors to the site will be briefed on the requirements of the Health and Safety Plan before being allowed within the work area, and will be accompanied by a foreman or supervisor whenever possible.

3.4.4 Personnel Protective Equipment (PPE)

Based on information from previous investigations of site conditions, it is anticipated that most excavation work can be done in Level D PPE. Level D PPE for this project consists of hard hat, steel-toed work shoes or boots, work gloves and safety glasses. Coveralls will be required for all work in exclusion zones. Prior to exiting any exclusion zones, personnel will go through decontamination, disposal of all appropriate PPE, and frisking procedures as described in the Health and Safety Plan.

3.4.5 Monitoring

A primary goal during the removal activities will be to control radioactive **and pesticide** particulates from the excavation, earth moving, and other activities on-site.- **A primary requirement of dust control is "no visible dust"**. Fugitive dust generation is caused by a range of activities including excavation, loading, dumping, transporting and scraping using heavy equipment such as bulldozers, front-end loaders, trucks and graders. Traffic along roadways causes resuspension of particulates.

An Air Monitoring Plan is included as Appendix 8 to this Work Plan. The principal objectives of the air monitoring activities are to:

- Ensure worker and general population safety and provide radiological control information;
- Evaluate work procedures and site control measures. In addition to identifying the need for corrective action, air monitoring also documents the effectiveness of such control actions;
- Measure releases of airborne radioactivity (should any occur) and ensure that people living and working in the surrounding area are not exposed to radiation above acceptable limits.

Air monitoring will be conducted at two levels. Site perimeter monitoring will be conducted at the four sides of the site (north, south, east, and west). This air monitoring is for the purpose of documenting, and if detected, initiating measures to control off-site airborne contamination. Air monitoring will be conducted in accordance with the Air Monitoring Procedure, SOP 212.

Personal air monitoring will be required for workers in an exclusion zone. Procedures for personal air monitoring are presented in the Health and Safety Plan included in Attachment 3.

3.5 Application of ALARA to Excavation

The clean-up criteria established is 5 pCi/g total radium (Ra-226 + Ra-228) above the background. Background for this area has been established on vicinity sites as 2.1 pCi/g, resulting in a clean-up criteria of less than or equal to 7.1 pCi/g total radium. Areas found to contain total radium in excess of the action criterion will be included in the removal activities. Averaging over areas up to 100 square meters is allowed, but only after reasonable efforts have been made to achieve as low as reasonably achievable (ALARA) levels. The principle of keeping ALARA radiation doses consistent with economic and social constraints also applies to the removal activities.

ALARA and the numerical criterion will be met through a coordinated program of surveys and verification conducted by TRS. USEPA and TRS will provide oversight role in the application of ALARA to the excavation activities.

3.6 Data Management

Data management for the site, as related to excavation activities, consists of health physics data, soil radioactivity data and civil construction and excavation data (i.e., land surveys, excavation volume estimates, etc.). Given the relatively short anticipated duration of the excavation activities for this project, data can be effectively managed utilizing the paper records required by this Work Plan.

An on-site or site vicinity field laboratory will be used to analyze soil samples as excavation and removal proceeds, and for pre-verification sampling that the **radiological** clean-up criteria have been met. Analytical records will be kept at the site and at the Vernon Hills, Illinois offices of TRS's contractor, STS Consultants, Ltd. Air monitoring analyses will be maintained at both the site and STS's offices, and will be transmitted with the monthly project progress reports to USEPA.